SERUM URIC ACID LEVELS IN PSORIASIS*

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This study was undertaken to confirm reports that psoriatic individuals frequently had elevated serum uric acid levels. Lobitz and Brunsting (cf. 1) found elevated blood uric acid concentrations in a relatively high percentage of severe psoriatics. They likewise found an elevated uric acid concentration in 15% of the usual uncomplicated cases of psoriasis. Steinberg *et al* (2) reported that hyperuricemia occurred in 48% of 98 male psoriatics and in 27% of 69 female psoriatics.

A total of 20 psoriatic and 24 non-psoriatic serum uric acid determinations were done. A comparison of the results revealed no significant differences in the two groups.

PROCEDURE

A total of seventeen individuals with active psoriasis, nine females and eight males, ranging in age from 20 years to 52 years were studied. For comparative purposes, a group of twenty-three non-psoriatic individuals, seven females and sixteen males, ranging in age from 16 years to 76 years were studied. Each subject was carefully screened to rule out hepatic disease, renal disease and gout before being included in this study. No subject was receiving any systemic medication or special diet when the study was done. In four subjects a second blood sample was drawn several days later to check the possibility of fluctuating concentrations of serum uric acid.

CHEMICAL METHODS

Serum uric acid concentrations were determined by the Brown modification (4) of the Folin colorimetric method, the "uricase" method (5) and by direct spectrophotometric analysis (6) in the ultra-violet region using a Beckman DU spectrophotometer.

The Brown-Folin method consists of only colorimetric determinations. The "uricase" method involves colorimetric determinations before and after enzymatic (uricase) digestion of uric acid. In the direct spectrophotometric method the destruction of uric acid by uricase is determined as a decrease in absorption at 293 mu.

All results are reported in milligrams per cent.

RESULTS

In the non-psoriatic group (Table I) serum uric acid values, as determined by the Brown-Folin Method, ranged from 3.80 to 6.10. The mean value was 5.04 with a mean deviation of 0.83. Uric acid values as determined by the "uricase" method ranged from 1.15 to 6.12. The mean value was 3.97 with a mean deviation of 1.35. The mean value for residual color was 0.74 with a mean deviation of 0.26. The mean value for total color was 4.71.

In the psoriatic group (Table II) serum uric acid values, as determined by the Brown-Folin method ranged from 2.20 to 6.60. The mean value was 4.58 with a mean deviation of 1.15. Uric acid values as determined by the "uricase" method ranged from 0.97 to 4.75. The mean value

TABLE I

Serum uric acid values in nonpsoriatic subjects

Subject	Age	Sex	Brown-Folin Method	Uricase Method		
				Total color	Uric acid	Residual color
	Yrs.		*mgm%*	*mgm%*	*mgm%*	*mgm%*
1	47	F	4.00	2.32	1.43	0.89
2	34	F	3.80	3.40	2.50	0.90
3	40	M	4.60	6.55	6.12	0.43
4	69	F	5.50	2.55	1.35	1.20
5	76	F	5.00	2.35	1.15	1.20
6	58	F	5.70	5.70	4.60	1.10
			5.30	5.25	4.64	0.61
7	32	M	5.70	5.05	4.43	0.52
8	29	M	5.90	5.75	5.25	0.52
9	40	M	6.10	6.05	5.43	0.62
10	16	M	5.00	5.15	4.30	0.85
11	18	M	4.80	5.30	4.53	0.77
12	63	M	4.80	5.40	5.10	0.33
13	32	M	4.40	5.15	4.75	0.40
Mean Value			5.04 ± 0.83	4.71	3.97 ± 1.35	0.74 ± 0.26

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TABLE II

Serum uric acid values in psoriatic subjects

Subject	Age	Sex	Brown-Folin Method	Uricase Method		
				Total Color	Uric Acid	Residual Color
	Yrs.		*mgm%*	*mgm%*	*mgm%*	*mgm%*
1	30	M	3.16	2.05	1.12	0.48
2	26	F	2.40	2.15	1.23	0.93
3	30	F	3.30	1.75	1.25	0.50
4	46	M	5.30	3.80	2.85	0.95
5	30	F	3.70	3.55	2.45	1.10
6	43	M	5.20	5.30	1.70	1.40
			5.10	3.05	2.58	0.47
7	27	M	6.60	3.00	2.05	0.95
			5.70	5.35	4.75	0.60
8	45	M	5.70	3.85	2.80	1.05
			5.70	3.60	2.28	1.32
9	39	M	5.90	4.75	3.50	1.25
10	52	F	2.20	2.05	0.65	1.40
11	20	F	5.30	2.15	1.38	0.77
12	26	F	4.10	1.85	0.97	0.88
13	21	F	4.00	4.35	4.35	0.00
Mean Value			4.58 ± 1.15	3.25	2.24 ± 0.95	0.88 ± 0.31

TABLE III

Comparison of colorimetric and spectrophotometric methods of uric acid values

Subject	Sex	Age	Brown-Folin Method	Spectrophotometric Method
		Yrs.	*mgm%*	*mgm%*
Psoriatics				
1	M	23	4.6	5.4
2	M	26	5.7	6.3
3	F	30	4.0	4.2
4	F	28	3.9	3.3
Non-psoriatics				
5	M	35	5.5	5.8
6	F	38	2.8	2.6
7	F	45	4.3	4.5
8	M	23	6.3	7.4
9	M	26	4.3	3.6
10	M	25	5.1	5.9
11	M	33	4.7	3.5
12	M	35	5.8	5.0
13	M	35	4.8	3.3
14	M	32	5.7	5.8
Mean value			4.66 ± 0.75	4.75 ± 1.18

TABLE IV

Comparative values for psoriatic and nonpsoriatic serum uric acid levels

Group	Brown-Folin Method	Uricase	Residual Color
	mgm%	*mgm%*	*mgm%*
Nonpsoriatic....	4.2–5.9	2.6–5.3	0.50–1.0
Psoriatic.....	3.4–5.7	1.3–3.2	0.60–1.2

was 2.24 with a mean deviation of 0.95. The mean value for residual color was 0.88 with a mean deviation of 0.31. The mean value for total color was 3.25.

A comparison of serum uric acid values obtained by the Brown-Folin method and the direct spectrophotometric method was made on fourteen sera (Table III). By the Brown-Folin method, the values ranged from 2.8 to 6.3. The mean value was 4.66 with a mean deviation of 0.75. Values ranged from 2.6 to 7.4 by the spectral method. The mean value for this method was 4.75 with a mean deviation of 1.18.

DISCUSSION

It is conceivable that aberrations in serum uric acid concentrations may exist in diseases involving abnormal protein synthesis since there is apparently a relationship between protein synthesis and nucleic acid metabolism and uric acid is an end product of purine catabolism (cf. 3, 7). It is possible that the previously observed uric acid elevations in psoriasis might have been the results of relatively nonspecific assay methods. Therefore, the problem of elevated serum uric acid concentrations in psoriasis was re-investigated in this laboratory utilizing the more specific "uricase" method as well as the usual colorimetric methods.

It can be seen from the data presented (Table IV) that the psoriatic group did not show elevated values by either the "uricase" or colorimetric method. Likewise, the "non-uric acid" chromogen values (residual color) were not significantly different in either group.

The results obtained by the Brown-Folin colorimetric method were compared with the results obtained using the spectrophotometric procedure since the latter method is technically a relatively simple procedure. Although the mean averages were practically the same, the range of

values was greater for the spectral method than for the Brown-Folin method.

It should be noted that the "uricase" method had a wider range of values than either the Brown-Folin method or the spectrophotometric method.

Jacobson (8) in an evaluation of the Folin colorimetric method reported serum uric acid concentrations above 6.0 mgm% in 3% of 1024 tests done on 961 non-gouty individuals. Stecker *et al* (9), using the colorimetric method, likewise studied 100 non-gouty individuals known to be free of renal or hepatic disease. They reported elevated serum uric acid concentrations in 3% of this group. Our more limited study revealed that two subjects (Table I, #9; Table III #8) in the non-psoriatic group, or 9%, had uric acid values above 6 mgm%. One subject (Table II, #7) in the psoriatic group, or 6%, had a value above 6 mgm%. The psoriatic subject with an initially elevated value showed a second value to be in a normal range. A single increased value therefore may simply represent an aberrant test with no diagnostic significance.

SUMMARY

Serum uric acid concentrations in 17 psoriatic and 23 non-psoriatic subjects were compared by colorimetric, enzymatic and spectrophotometric technics. No significant differences were observed between the two groups.

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